

PATENT
IBM Docket No. RAL920000082US1

Amendments to the Specification:

Amend page 1, paragraph beginning at line 8, as follows:

Asymmetrical Digital Subscriber Line (ADSL) modems offer a high speed alternative (up to 8 Mbps, depending on line conditions) to conventional analog modem technology. United States patent application number 09/135,221, (now U.S. Patent No. 6,498,806) filed, August 17, 1998, issued December 24, 2002 and assigned to the same assignee as this application, is incorporated by reference herein. Patent application 09/135,221, hereafter referred to as the 98 application, is directed to a shared asymmetric subscriber line modem. The 98 application introduced the concept of using a single multidrop modem in a central office Digital Subscriber Line Access Multiplexer (DSLAM) to drive multiple subscriber lines. Line sharing was implemented by allocating a small portion of the available bandwidth to a control channel which was used to indicate to a group of client modems which one of the client modems was the intended recipient of a corresponding physical frame of data. This solution resulted in a significant simplification of the digital portion of the ADSL server modem as well as the Digital to Analog converter. This solution requires a separate line driver for each of the subscriber lines. While this is not a major cost consideration, the power dissipated in each of these line drivers becomes a limiting factor in achieving higher levels of integration on ADSL server line circuit cards.

Amend page 3, paragraph beginning at line 2, as follows:

Figures 2, 3 and 4 are block diagrams of different embodiments of the transmitter of a shared multi-drop modem constructed according to the present invention.

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Amend page 4, paragraph beginning at line 3, as follows:

Block 14 includes symbol buffer 234 connected the output of IDFT 232 and a parallel to serial converter 236 for receiving the content of symbol buffer 234. The output of converter 236 is applied to block 15 which includes D/A converter 238 controlled by timing and control 250 and the transmission filter 240. The output of block 15 is applied to line drivers 16-1 - 16-n (not specifically illustrated in the 98 application) which include the isolation buffers 242 of Figure 7 of the 98 application.

Amend page 5, paragraph beginning at line 4, as follows:

In order to better understand the invention disclosed in this application one needs to compare Figure 1 of this application (the abbreviated version of the transmit portion of Figure 7 in the 98 application) to Figure 2 which will be described below. In Figure 1, data destined for a specific client is enclosed in a frame which includes a control field. The control field includes the identity of the client the frame is directed to. This frame is transmitted, at full power, to all of the clients connected to shared DSL modem. Only the identified client is authorized to receive the frame. The others will normally discard frames not specifically directed to them.

Amend page 5, paragraph beginning at line 18, as follows:

In the block diagram of Figure 2 blocks which are identical in function and structure bear the same reference numerals as used in Figure 1 and blocks which are only structurally the same bear the same reference numeral primed. In Figure 2 blocks 11, 12, 13 and 14 perform the exact same function as the similarly numbered blocks in Figure 1. A control channel 20 receives sufficient information from block 11 to generate a frame which includes the same control channel which was included in the frame generated in block 11

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(the data portion included in the frame prepared in block 11 is eliminated). In this regard the information can take several forms. At a minimum the information must include the identity of the client which is to receive the frame in process. It could include the entire frame prepared in block 11 or some other subset thereof. In any event the control channel will generate a second frame which includes only a control channel identical to the control channel generated in block 11 or it may include in addition a low power synchronization field. The control channel sends this truncated frame to block 12' which is structurally identical to block 12. The frame from block 12' passes through blocks 13' and 14' which are structurally identical to block 13 and 14, respectively. Since blocks 11 and 20 are operating on the same input data the generation of the control channel could utilize common hardware or it could be accomplished by simply stripping the data portion of the frame generated in block 11 in block 20 and adding a low power synchronization signal if deemed prudent.

Amend page 6, paragraph beginning at line 13, as follows:

Control channel 20 sends the identity of the client modem, to which the frame is addressed, to a frame select switch 21. Switch 21 receives the inputs from blocks 14 and 14' and sends the frame from block 14 to a TX filter/DAC 15-i where i is the TX filter/DAC connected to the line driver 16-i which provide a path to the client modem identified in the control channel as the recipient of the frame. Switch 21 sends the frame from 14' to all of the TX filter/DACs except 15-i. With this arrangement full power is only applied to line driver 16-i. The other line drivers receive only the control channel or the control channel and a low power synchronization signal if the alternative is chosen. This arrangement results in a significant reduction in the total power required in the line driver circuits. Alternatively, switch 21 could be designed to examine the contents of the control channel and perform the described switching function based on that information. Such a modification would be functionally equivalent.

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Amend page 10, add following new paragraph after line 17, as follows:

What is claimed is: